OPERATING INSTRUCTIONS
SKY CHAMPION
Model S-20



the hallicrafters inc.
2611 INDIANA AVENUE
CHICAGO

GUARANTEE

This receiver is guaranteed to be free from any defect in workmanship and material that may develop within a period of ninety (90) days from date of purchase, under the terms of the standard guarantee, as designated by the Radio Manufacturers Association. Any part or parts that prove defective within this period will be replaced without charge when subjected to examination at our factory, providing such defect, in our opinion, is due to faulty material or workmanship, and not caused by tampering, abuse or normal wear. All such adjustments to be made FOB the factory.

Should this receiver require any adjustments, your dealer or distributor has complete technical service information, or the factory will be glad to assist you in any problem direct.

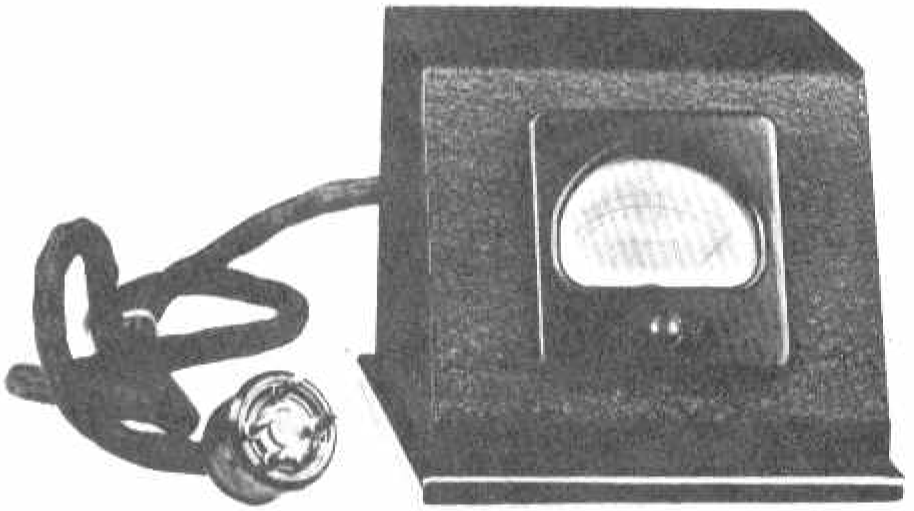
Should it be necessary to return any part or parts to the factory, a "Return Material Permit" must be obtained in advance by first writing the Adjustment Department, who will issue due authorization under the terms of the guarantee.

The Hallicrafters, Inc., reserve the right to make changes in design or add improvements to instruments manufactured by them, without incurring any obligation to install the same in any instrument previously purchased.

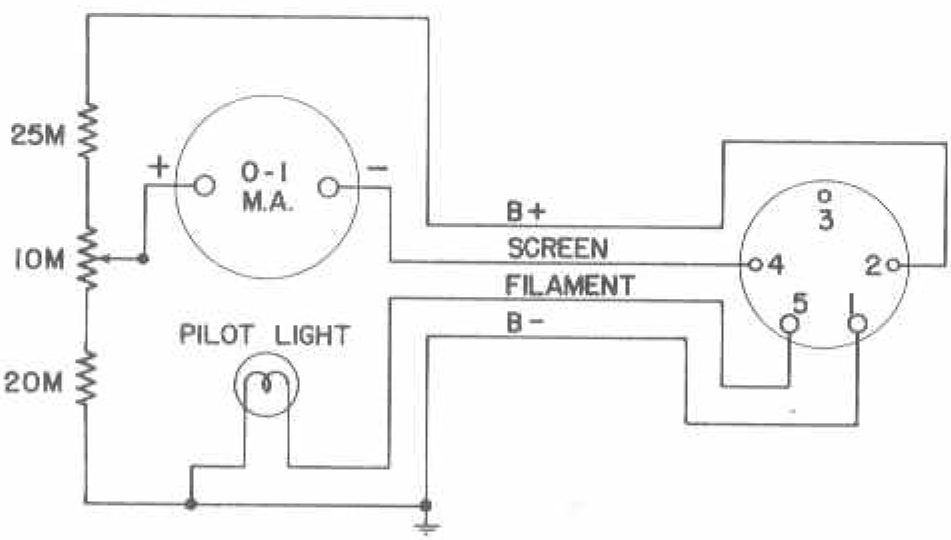
All Hallicrafters receivers are built under patents of Radio Corporation of America and Hazeltine Corporation.

THE HALLICRAFTERS

TYPE SM18
"S" METER



The HALLICRAFTERS signal strength indicator, type **SM18**, is complete. This meter has been designed as an accessory to the SKY CHALLENGER II. All that is necessary to connect the meter to the SKY CHALLENGER II is to plug it into its socket on the back of the receiver chassis. The indirectly illuminated scale is calibrated in "S" units and will provide a convenient means of checking the relative carrier strength of incoming signals. On the rear of the meter case is mounted the zero setting resistor. The three foot connecting cable will allow placing the meter at either end or on top of the receiver cabinet. The type SM18 meter is available through your HALLICRAFTERS distributor at a price of $10.00.



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THE SKY-CHAMPION IS AN 8 TUBE 4 BAND SUPERHETERODYNE RECEIVER COVERING THE FOLLOWING FREQUENCIES:

BAND	COVERAGE
1	540 KC TO 1,800 KC
2	1.70 MC TO 5.75 MC
3	5.62 MC TO 18.40 MC
4	17.00 MC TO 44.00 MC

SEPARATE COILS ARE USED TO COVER EACH BAND. INDUCTIVE COUPLING TO THE ANTENNA PERMITS THE MAXIMUM TRANSFER OF SIGNAL ENERGY FROM EACH SEPARATE PRIMARY TO THE PARTICULAR SECONDARY COIL IN THE CIRCUIT. THE UNUSED COILS ARE SHORTED. THE CALIBRATION ON THE MAIN DIAL IS IN KILOCYCLES ON BAND #1 AND IN MEGACYCLES ON BANDS # 2,3 AND 4.

YOU WILL FIND THE NEW SKY-CHAMPION DIAL MECHANISM OF PARTICULAR IMPORTANCE IN ENJOYING THE OPERATION OF THIS RECEIVER. BAND-SPREADING OF ALL FREQUENCIES COVERED BY THE SKY-CHAMPION ALLOWS EASIER TUNING AS WELL AS A READY MEANS OF LOGGING STATIONS. THE FLY-WHEEL EQUIPPED MECHANISM AFFORDS EFFORTLESS TUNING OVER LONG PERIODS OF TIME.

THE SEND-RECEIVE SWITCH ENABLES THE OPERATOR TO MAKE THE RECEIVER INOPERATIVE TEMPORARILY DURING STAND-BY PERIODS. SHOULD THE RECEIVER BE USED IN CONJUNCTION WITH A TRANSMITTER THIS FEATURE WILL PROVE VALUABLE.

ANTENNA: ON THE BACK OF THE CHASSIS WILL BE FOUND THE ANTENNA, DOUBLET AND GROUND TERMINAL STRIP. A CONVENTIONAL SINGLE WIRE ANTENNA SHOULD BE CONNECTED TO A1, AND THE JUMPER BETWEEN A2 AND G LEFT CONNECTED. A 75 FOOT PIECE OF #14 ENAMELED WIRE INSULATED AND SUSPENDED IN THE CLEAR IS RECOMMENDED FOR THIS TYPE OF ANTENNA. IF A DOUBLET ANTENNA IS USED THE TWO WIRES OF THE LEAD-IN ARE CONNECTED TO A1 AND A2 AND THE JUMPER BETWEEN A2 AND G REMOVED. A GROUND CAN BE CONNECTED TO THE G TERMINAL WITH EITHER TYPE OF ANTENNA. IT IS SUGGESTED THAT A GROUND BE LEFT OFF THE RECEIVER ONLY IF IN SO DOING THE PERFORMANCE OF THE RECEIVER IS IMPROVED. THERE ARE SO MANY DIFFERENT VERSIONS OF ANTENNA SYSTEMS THAT WE SUGGEST TO THE USER WHO WISHES TO EXPERIMENT WITH THE VARIOUS TYPES THAT HE FIRST FAMILIARIZE HIMSELF WITH THE ANTENNA SECTION OF THE A.R.R.L. HANDBOOK.

OPERATION: UNLESS OTHERWISE SPECIFIED THE RECEIVER IS DESIGNED TO OPERATE ON 110-120 VOLTS, 50-60 CYCLE ALTERNATING CURRENT. PLUG THE POWER CORD INTO THE SOCKET AND TURN THE CONTROL MARKED "AUDIO GAIN" TO THE RIGHT. THE RECEIVER WILL THEN BE CONNECTED TO THE POWER LINE. AFTER THE REQUIRED FEW MOMENTS HAVE PASSED NECESSARY FOR THE TUBES TO REACH OPERATING TEMPERATURE THE UNIT CAN BE PLACED IN OPERATION.

The "BANDS" switch should be placed on Band #1, or Standard Broadcast, when the receiver is first used. After you have familiarized yourself yourself with the operation of the receiver on that band the 3 higher frequency ranges may be tried.
It may be advisable to call to your attention the peculiarities of reception of the 4th band. Frequencies covered by this band are usually good only during the daylight hours. Additionally, skip conditions being favorable, you will be able to hear only signals which have the point of their origination removed by at least 1,500 miles from your location. Reception on this band is very freaky and rapidly affected by quickly changing high frequency conditions.

The A.V.C. or Automatic Volume Control switch provides optional use of A.V.C. When receiving music or voice signals it is advisable that the switch be in the "ON" position. When receiving code transmissions the switch should always be in the "OFF" position.
The B.F.O. switch must be in the "ON" position to obtain the necessary beat note for the reception of code signals. Using the B.F.O. will be helpful in locating the carriers of distant and possibly weak broadcasting stations. Once located, the B.F.O. should be turned off or the whistle will interfere with reception.
The PITCH CONTROL - when the B.F.O. is "ON" - will allow you to vary the frequency of the resultant beat note to one that is most pleasing to you.
A head-phone jack is mounted in an accessible position on the front panel of the Sky-Champion. Any type of headphones can be used because no direct current flows in the headphone circuit. When the phones are plugged in the loud speaker is automatically disconnected.

On the back of the chassis you will find a socket into which you can plug a Type SM-18 carrier level indicator. When this meter is used it will be necessary to advance the R.F. Gain control on the receiver as far as it will go to the right. Doing this will operate the switch which is mounted on the back of this control. Additionally the A.V.C. switch should be in the "ON" position to properly connect the meter in the circuit. This meter is available through the dealer from whom you purchased your receiver.

The tube-line-up of the S-20 Sky-Champion is as follows:

6K7	R.F. stage
6L7	1st Detector - Mixer
6J5G	H. F. Oscillator
6K7	I. F. Amplifier
6Q7G	2nd Detector, A.V.C., 1st stage of Audio
6F6G	Audio output stage
6J5G	Beat frequency oscillator
80	Rectifier

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SKY-CHAMPION MODEL S-20 PARTS LIST

RESISTORS

No.	Ohms	Wattage	Parts No.
R1	10,000	R. F. GAIN	25-029
2	100,000	1/3	20-093
3	350	"	20-120
4	100,000	"	20-093
5	600	"	22-125
6	30,000	1	22-075
7	300	1/3	20-021
8	20,000	"	20-072
9	300	"	20-021
10	250,000	"	20-099
11	500,000	A. F. GAIN	25-031
12	1,000,000	1/3	20-108
13	100	"	20-009
14	25,000	1	20-073
15	100,000	1/3	20-093
16	50,000	"	20-084
17	500,000	TONE CONTROL	25-018
18	500	1	20-025
19	20,000	"	20-070
20	25,000	"	20-073
21	100,000	1/3	20-093
22	10,000	1	20-061
23	50,000	1/3	20-084

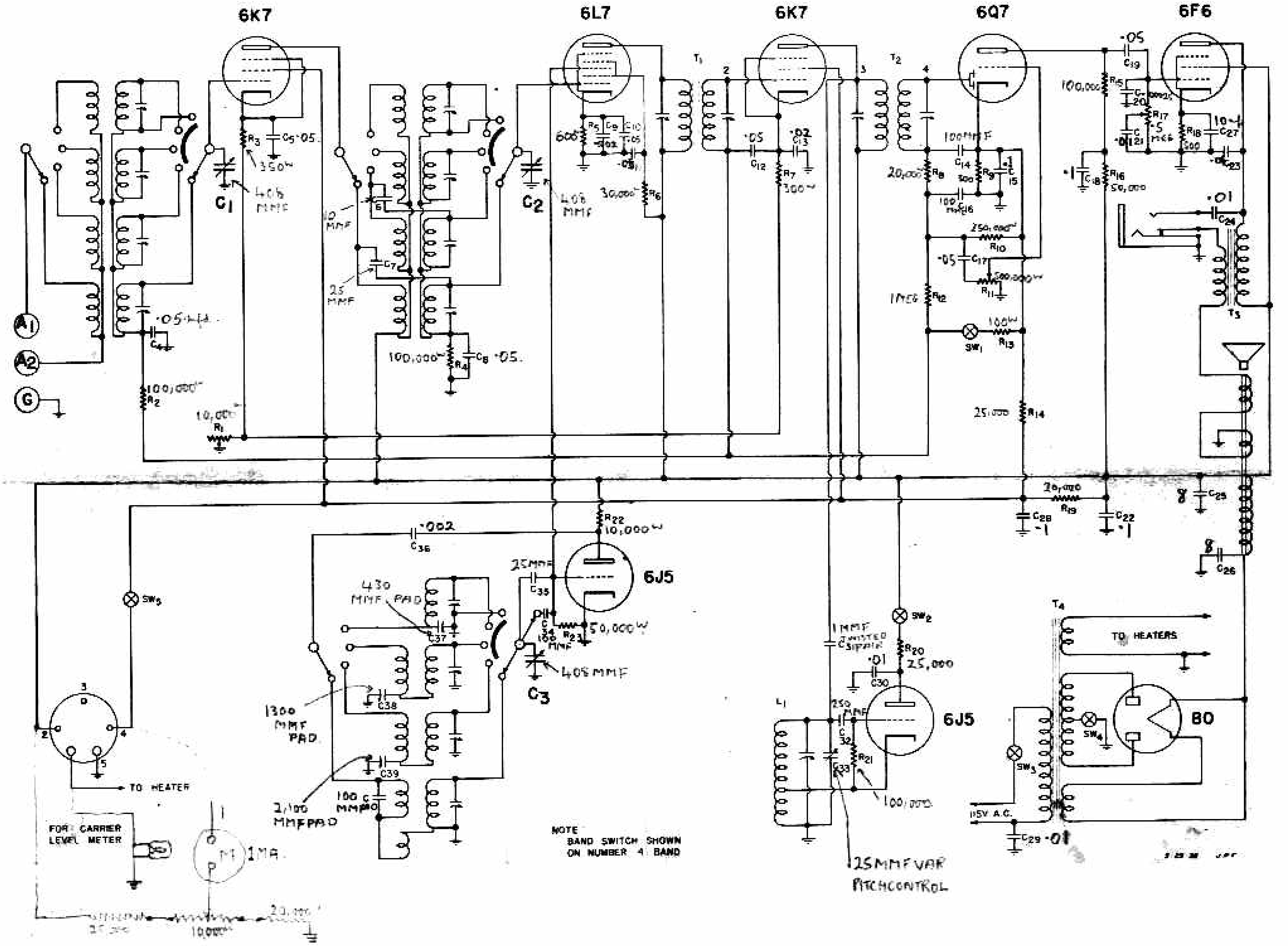
SWITCHES

SW	
1	A. V. C. SPST
2	B. F. O. SPST
3	AC ON-OFF (ON TONE CONTROL)
4	SEND - RECEIVE SPST
5	EXT "S" METER (ON RF GAIN)

CONDENSERS

No.	Capacity	Type	Voltage	Parts No.
C1		MAIN		
2	408 MMFD			48-022
3		TUNING		
4	.05 MFD		200	41-004
5	.05 "		200	41-004
6	10 MMFD	MICA		40-021
7	25 "	"		40-024
8	.05 MFD		200	41-004
9	.002 "	"		40-013
10	.05 "		200	41-004
11	.05 "		400	41-005
12	.05 "		200	41-004
13	.02 "		200	41-002
14	100 MMFD	"		40-007
15	.1 MFD		200	41-006
16	100 MMFD	"		40-007
17	.05 MFD		200	41-004
18	.1 "		400	41-007
19	.05 "		400	41-005
20	.00025"	"		40-024
21	.01 "		200	41-000
22	.1 "		400	41-007
23	.01 "		600	45-002
24	.01 "		600	45-002
25	8 "		450	
26	8 "		450	42-021
27	10 "		25	
28	.1 "		400	41-007
29	.01 "		400	41-001
30	.01 "		400	41-001
31	1 MMFD	TWISTED PAIR		
32	250 "	MICA		40-024
33	25 "	PITCH CONTROL		48-021
34	100 "	MICA		40-007
35	25 "	"		40-024
36	.002 MFD	"		40-013
37	430 MMFD	PAD		44-025
38	1,300 "	"		44-024
39	2,100 "	"		44-025
40	100 "	MICA		40-007

SCHEMATIC DIAGRAM — SKY CHAMPION — MODEL 120



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